

REMARKS

This application has been reviewed in light of the Office Action dated May 3, 2004. Claims 1, 3-6, 9, 30, 33 and 37-44 are presented for examination. Claims 2, 7 and 8, as well as the non-elected claims, have been canceled without prejudice or disclaimer of subject matter, and those claims will not be mentioned further. Claims 1, 3-6, 9 and 30 have been amended to define still more clearly what Applicant regards as his invention. Claims 37-44 have been added to provide Applicant with a more complete scope of protection. Claims 1, 30, 33, 37, 43 and 44 are in independent form. Favorable reconsideration is requested.

Initially, Applicant confirms that the description of the substance of the telephonic interview dated April 12, 2004, in the Interview Summary that accompanied the outstanding Office Action is correct.

In that Office Action, Claims 1, 3 and 30 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,330,083 (Nabeshima et al.). Claim 4 was rejected under 35 U.S.C. § 103(a) as being obvious from *Nabeshima* in view of U.S. Patent 5,289,286 (Nakamura et al.), Claims 5, 6 and 9, as being obvious from *Nabeshima* in view of U.S. Patent 5,659,355 (Barron et al.), and Claim 33, as being obvious from *Nabeshima*.

The present invention, as is described in more detail in the application, is intended to ameliorate or eliminate problems encountered with linear image sensors designed for high-speed read-out. In such sensors, it is common to divide the sensor elements into even and odd groups, and to read out the groups separately but in tandem. A greater improvement in speed is achieved if, in addition, the elements are divided into a

right and a left group, so that in all, four groups are read out in tandem. Offsets frequently occur between the various groups of elements, however, and this fact itself poses problems. The offset between the right and the left elements tends to produce a visible line down the middle of the frame, and even if the sensor is tested and adjusted in advance to compensate for the offset so as to eliminate the line, changes in temperature, and simply the aging of the sensor, cause the problem to re-appear. (The offset that occurs between the elements of the odd and the even group, on the other hand, tends not to be problematic, because it manifests itself in the image merely as a slight variation from pixel to pixel that the observer does not notice.) The present invention addresses the problem of obtaining high-speed read-out while avoiding the problem of visible artifacts, such as those described, in the resulting image.

For example, independent Claim 1 is directed to an image input apparatus that comprises a photoelectric conversion unit adapted to acquire image information of an object from a plurality of divided areas and to output signals from each of a plurality of output units corresponding to respective ones of the areas. In this apparatus, each of the areas includes an effective pixel portion and a non-image pixel portion. Also provided in the apparatus is a correcting unit adapted to correct offset components contained in the signals output from each of the output units during a period of acquiring the image information. The correction is performed in accordance with (i) a first signal output from the effective pixel portion during a period other than the image information acquiring, (ii) a second signal output from the non-image pixel portion during the period other than the

image information acquiring, and (iii) a third signal output from the non-image pixel portion during the period of acquiring image information.

Nabeshima, Nakamura and Barron each relate to conventional photoelectric conversion units adapted to acquire image information of an object. The *Nabeshima* apparatus, for example, which uses a linear array of pixels (see Fig. 6A) to obtain image data, periodically detects the light output of the fluorescent light source used to illuminate the document being read, and a correction is performed to compensate for observed fluctuations in the light output. The timing at which the periodic observations is made can itself be controlled based on various factors, including the number of documents that have been read, the copying mode that has been set, etc.

Even if *Nabeshima* is deemed to show obtaining image data from a plurality of divided areas and outputting signals from each of a plurality of output units corresponding to those areas, however, Applicants submit that nothing has been found, or pointed out, in that patent that would teach or suggest any arrangement in which "each of the areas includes an effective pixel portion and a non-image pixel portion", as recited in Claim 1. Still less would anything in *Nabeshima* teach or suggest such an apparatus that also performs a correction based on three signals as recited in Claim 1, i.e., "correcting offset components contained in the signals output from each of the output units during a period of acquiring the image information, in accordance with a first signal output from the effective pixel portion during a period other than the image information acquiring, and a third signal output from the non-image pixel portion during the period of acquiring image

information". For all those reasons, Claim 1 is believed to be clearly allowable over *Nabeshima*.

Independent Claim 37 is directed to an image input apparatus that comprises a photoelectric conversion unit adapted to acquire image information of an object from a plurality of divided areas and output signals from each of a plurality of output units corresponding to respective ones of the areas, each of the areas including an effective pixel portion and a non-image pixel portion. The apparatus also has a correcting unit adapted to correct offset components contained in the signals output from each of the output units during a period of acquiring image information, in accordance with (i) a first signal output from the effective pixel portion during a period other than the image information acquiring, (ii) a second signal output from the non-image pixel portion during the period of acquiring the image information, and (iii) an average of the second signal.

Nabeshima, again, even if it may show a photoelectric conversion unit adapted to acquire image information of an object from a plurality of divided areas and output signals from each of a plurality of output units corresponding to each of the areas, is not believed to teach or suggest any arrangement in which "each of the areas includes an effective pixel portion and a non-image pixel portion", as recited in Claim 37. Moreover, nothing found or pointed out in *Nabeshima* would teach or suggest such an arrangement that also has "a correcting unit adapted to correct offset components contained in the signals output from each of the output units during a period of acquiring Image information, in accordance with a first signal output from the effective pixel portion during a period other than the image information acquiring, a second signal output from the non-

image pixel portion during the period of acquiring the image information, and an average of the second signal”, as recited in Claim 37. For both reasons, therefore, Claim 37 is believed to be clearly allowable over that patent.

Each of the other independent claims is either a method claim or a storage-medium claim corresponding to one or the other of the apparatus claims discussed above, and is also deemed allowable by virtue of at least the reasons given above with regard to the respective apparatus claims.

A review of the other art of record, including *Nakamura* and *Barron*, has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as a reference against the independent claims herein. Those claims are therefore believed patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



Leonard P. Diana
Attorney for Applicant
Registration No.: 29,296

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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